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ABSTRACT

The Oregon Board of Higher Education approved a revision of its existing budgeting procedure, the result of nearly two years' work. The effort was undertaken because of deeply held concern about both the adequacy of the resources provided and the equity of the distribution of the available funds to the several institutions. It was determined that reliance on a student-teacher ratio or a cost-per-student basis as an exclusive measure for allocating/acquiring funds does not assure equity and that a line-item budget neither assures equity nor permits the administrative flexibility essential to a dynamic institution. A Resource Allocation/Acquisition Model was proposed that considers separately the sums for each of seven functions: instruction, nonsponsored research, extension and public services, libraries and museums (academic support), student services, operation and maintenance of the physical plant, and general institutional support. Implementation of the model and further analysis needs related to it are described. (LP4)

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A Revised Budgeting System for the Oregon Department of Higher Education

by Freeman Holmer

HE008224

The Oregon Board of Higher Education, at its January meeting, approved a revision of its existing budgeting procedure. The revision was the result of nearly two years' work on the part of representatives of Oregon state institutions and the staff of the Office of Administration of the Oregon Department of Higher Education, who considered the revision of methods by which biennial budget requests and annual operating budgets of the department are developed. The effort was undertaken because of deeply held concern about both the adequacy of the resources provided and the equity of the distribution of the available funds to the several institutions.

In requesting and allocating funds under traditional policies, the universities, colleges, and the Oregon Institute of Technology received "fixed" amounts for general administration and for physical plant operation and maintenance. These allocations were based on a series of specific decisions over the years. Changes were individually justified and determined. For the "variable" or student-related costs (instruction, libraries, student services), allocations were based on enrollment estimates by level of student. The amount allocated for each full-time equivalent upper-division student was 125 percent of that for each lower-division student and the amount for each graduate student was twice that for a lower-division student.

This somewhat oversimplified version of the allocation process is sufficient to identify four major elements of concern:

1. There is no external standard against which to measure the adequacy of the funds provided.

2. Administrators at institutions with a large proportion of part-time students believe that the reliance on "full-time equivalent students" as the basis for budget allocations may underestimate the costs that should be incurred in serving part-time students.

3. Administrators at institutions with higher than average proportions of lower-division or graduate students question the allocation judgment that ratios of 1.00 (lower-division), 1.25 (upper-division), and 2.00 (graduate) reflect cost differences realistically.

4. Some administrators question whether "average" funding adequately reflects the costs of the mix of academic programs at particular institutions.

I. The Information Problem

Budgeting for higher education is complex because the institutions engage in an array of activities which are not performed in precisely the same way on any two campuses. There are even differences in the way two classes that are nominally the same are taught on a single campus. There are fundamental disagreements about the purposes of higher education and a dearth of objective measures of workloads, outcomes, and products that characterize institutional activity.

Many measures are used: student credit hours, degrees awarded, faculty contact hours, percentage of classroom utilization, student-teacher ratios, and many more. But there is little agreement on definitions or the meaning of the calculations based on the measures. Student-teacher ratios (such as fifteen students to one professor) are sometimes used to argue for a higher ratio (reduced staffing) or a lower ratio (increased staffing) on the assumption that the student-teacher ratio affects the quality of instruction. However, there is disagreement about that assumption and there is no objectively established ratio that is accepted both by the academic community and the external agencies that review institution budgets. Similarly, although there is a widely-held consensus about what constitutes a student credit hour, there is no universally-agreed objective definition of this unit of workload measurement.

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A. Improving Management Information

Both critics and friends of higher education have deplored the lack of reliable measures of productivity. Much effort has been and is being invested in responding to the calls for "accountability." One response was the establishment in 1968 by the Western Interstate Commission for Higher Education (WICHE) of a "Management Information Systems" project to seek agreement among the member states on data definitions and other measurement standards that might facilitate interinstitutional comparisons. The WICHE effort has since become the National Center for Higher Education Management Systems (NCHEMS), which is funded primarily by contract with the National Institute of Education and by foundation grants.

NCHEMS has produced several useful tools in the effort to improve fiscal management of higher education, including a Data Element Dictionary that reduces some of the ambiguities of definition. Other developments are a Program Classification Structure that emphasizes the need for more consistent allocation of expenditures to carefully defined program categories, and a procedure for analysis of faculty activities to permit more accurate allocation of faculty salaries to programs. There is also a Resource Requirements Prediction Model (computerized) that facilitates budget estimates based on a series of assumptions about program changes, enrollment changes, changes in student-teacher ratios, and others.

B. Interinstitutional Exchange of Information

A significant current development of NCHEMS is the Information Exchange Program (IEP) which is based on the foregoing models, adapted to produce information about program costs in a format that facilitates comparisons of costs by function and by discipline within the instruction function. More than 300 institutions are in varying stages of implementing the IEP. The effort requires changes in accounting and reporting systems that cannot be accomplished quickly. The IEP has been applied to the 1974-75 budgets for the Oregon colleges and universities and Oregon Institute of Technology. There are some apparent discrepancies in the data reported but these are expected to be corrected in the 1975-76 and subsequent IEP analyses. Oregon's community colleges are also preparing to implement the IEP.

The real budget-making benefit of the IEP exercise should be experienced when there are enough other institutions following the IEP procedures that we may select those with characteristics similar to ours for "information exchange." Then we will have an external basis of comparison which can be used in lieu of an absolute standard.

For the time being (that is in building the 1977-79 budget request), it is possible to approximate the IEP procedure by using the results of an IEP-like exchange of data relating to the instruction function among several state universities. These data are available for 1973-74. Detailed information about teaching loads in each academic discipline, by level of course and by level of student, is available for a representative sample of these institutions. The data exchange provides average salaries of ranked faculty and average distributions of rank. These data appear to provide an external comparison, which may have some utility as a standard.

II. The Limits of "Modeling"

It is often convenient to adopt mathematical statements as a basis for describing human organizations and their management processes. Making the statements in mathematical terms sometimes facilitates understanding and experimentation.

Student-teacher ratios (S-TR) such as 1:1 or 50:1 describe quite different educational organizations with a common measure (Mark Hopkins, his log, and one student *vs.* an overworked faculty in an underfunded institution). Such a mathematical formula tells only part of the story, of course, but it provides a beginning.

A. The Elements of a Model

Similarly, acres of campus per campus grounds maintenance employee, or library books per student or degree program, or percentage of laboratory utilization describe other characteristics. When these are put together with other workload and quality indicators, one can establish mathematical formulas that can be used to develop a budget that will fund an institution as defined by certain criteria. For example, the budget model could be simply $x per fall term student. The budget model can be much more complicated, including a series of measures and associated unit costs. Indeed, equity among institutions tends to require complication so that *real* differences are reflected in the *model*. There are differences in cost by level of course or by level of student (graduate *vs.* under-

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graduate). Research universities have obligations that may not be characteristic of colleges.

There are three usual elements in a budget model: a resource measurement, a workload measure, and a dollar standard. If we know how many credit hours of lower division Spanish are taught, how many credit hours of lower division Spanish are taught by the average teacher, and what the average pay of Spanish teachers is (or should be), it is no great mathematical trick to determine what the budget for teaching lower division Spanish might be.

B. The Role of Judgment

It must be recognized, however, that judgment enters into each of these determinations. "Lower division Spanish" sounds like an objectively described, measurable category of credit hours but certainly the credit hours are not uniform. Even in the same class, students require different amounts of instructional help. "Credit hours taught by the average teacher" is easily determined but the model-maker has a wide range of choice in deciding what universe to use in calculating an average. The alternatives include: lower division Spanish teachers; all Spanish teachers; all modern language teachers at one institution; at state system institutions; at public institutions. There are others. The point is that the choice made at this point will have a substantial impact on the effect of the model. The same range of choice would apply in picking an average salary to include in a model.

A budget model appears to be objective. Clearly, however, its elements rest on choices from many alternatives. To the extent that the workload and resource measures are *representative of reality* and the dollar standard is truly a *standard*, the model will produce results that are helpful. There are two kinds of standards that are preferred: an objective standard (that establishes on the basis of scientific experimentation what ought to be a normal rate of productivity and cost); and an external or comparative standard (based on the productivity and costs characteristic of other similar institutions). A third, historical, standard is often used but it assumes that an institution's past rates of productivity and cost ought to be maintained. That assumption is rarely valid, although it is useful to a model-maker in the absence of an objective or an external standard.

A model is a human construct. It can be changed easily by substituting different components or standards. Using "full-time equivalent students" in a budget model produces a different result from using "head-count students." For particular functions, full-time or headcount or a combination (or some other measure) may be more representative. The "standard" to be applied in a model can be changed. A student-teacher ratio of 17 to 1 can be changed by competent authority to 15 to 1 or 20 to 1. The basis for such a change may be intuition or adjustment to a predetermined budget limit, or, more appropriately, it will result from an exhaustive analysis of essential or desirable characteristics. A change may be warranted by a study of the characteristics observed elsewhere. These observations indicate that a model represents a series of judgments, and the quality of those judgments determines the utility of the model.

III. Specifications for a Resource Allocation/Acquisition Model

The state interinstitutional Committee on Resource Allocation/Acquisition (CORA/A) spent some twenty months reviewing the options available when constructing a budget model for Oregon colleges, universities, and the Oregon Institute of Technology. The model described below is, in large measure, a result of the committee's deliberations.

Specifications may take many forms for the preparation of requests for (and allocation of) the sums needed for financing the institutions in a state system of higher education. The most time-honored set of specifications requires detailed identification of each position, each item of equipment, each item of supply, and any other object of expenditure. In more recent years, there has been less insistence on such "line-item" review and greater reliance on a "cost-per-student" model. The "cost-per-student" approach tends to give great credence to current levels of funding and is "student-driven," despite the fact that significant functions of a college or university are essential to society but are not directly related to the number of students on a campus. For example, the maintenance of an adequate library is influenced only to a limited extent by the number of students; it is more strongly affected by the number of disciplines for which an institution is the instructional and research agent.

In the Oregon State System of Higher Education (OSSHE), each institution has a different set of curricular and research responsibilities and a different clientele. In devising a basis for requesting or allocating funds for the institutions, a method is needed to identify the necessary resources in ways which equitably reflect differences in institutional mission, institutional size, institutional complexity, and institutional location.

The Committee on Resource Allocation/Acquisition concluded that reliance on a student-teacher ratio or a cost-per-student basis as an exclusive measure for allocating/acquiring funds does not assure equity and that a line-item budget neither assures equity nor permits the administrative flexibility that is essential for a dynamic institution. Accordingly, CORA/A proposed that in allocating/acquiring funds for OSSHE institutions, the sums required should be determined separately for each of seven functions: instruction, nonsponsored research, extension and public services, libraries and museums (academic sup-

port), student services, operation and maintenance of the physical plant, and general institution support.

The specifications for a mathematical model for determining the sums required must thus call for the addition of the sums determined for each of seven "function" formulas. One of the seven (extension and public service) is not readily susceptible of determination by formula; accordingly, extension and public service needs will be determined on an essentially line-item basis. The remaining six models are described below.

A. The Instruction Formula

By far, the largest proportion of the expenditures at institutions of the Oregon State System of Higher Education is devoted to the provision of instruction of students. The very nature of higher education assumes that each faculty member is expected to engage in scholarly activities in support of the teaching responsibility and such activity is so treated in the "instruction" specification. Following are seven separate elements in the instruction specifications.

- *Instruction per se:* the time of faculty members spent in teaching and in preparing for teaching, in the classroom or the laboratory, in the field, or as academic advisers to students.
- *Coordination of instruction:* the work of department and division chairmen, deans, and various other officers of instruction.
- *Administrative and clerical support:* nonacademic personnel involved in provision of services in support of the instruction activity, which would include typing and business management.
- *Technical support:* nonacademic personnel providing technical assistance such as equipment maintenance and construction and laboratory assistance.
- *Staff development and in-service training:* expenses of enhancing the experience and knowledge of instruction personnel, such as attendance at workshops, seminars and professional meetings.
- *Services and supplies:* telephones, duplicating, mailing, chemicals, specimens, computer services and other supplies and services.
- *Other:* replacement and new equipment may be justified by separately established procedures; payroll assessments and staff benefit costs will be determined as required by budget instructions.

The components of the model for instruction and nonsponsored research may be expressed in the following formulas.

1. **Instruction per se.** Three-term student credit hours per (two-digit) HEGIS discipline and level of course for lower division and upper division courses and by level of graduate student (doctoral candidate; other postbaccalaureate) for courses taken.

Average student credit hours taught by the average FTE faculty member in the same categories in the information exchanged among selected public universities.[1]

Average annual salary of faculty members in each discipline as calculated from the data exchange group plus information separately collected about average salaries for graduate assistants, modified for the colleges and the Oregon Institute of Technology to reflect existing salary differentials.

2. **Instructional coordination.** The funding of the academic staff positions required for administration of departments, divisions, schools and colleges is determined as a sum proportional to the amount produced by the instructional faculty salary model. Ten percent is deemed appropriate.

3. **Technical support.** This includes stores clerks, equipment maintenance personnel, etc., to be determined as one position for each ten faculty members, funded at the salary of a Laboratory Technician 3 (Step 2): $8,580. (In preparing 1977-1979 budget requests, updated salary rates will be used.)

4. **Administrative and clerical support.** The allowance is one FTE per five FTE faculty, funded at the salary of a Secretary 3 (Step 2): $6,396.

5. **Staff development and in-service training.** An allowance is made that is equal to 2 percent of the instructional faculty salary amount at the universities and 2.25 percent of the salaries at the colleges and Oregon Institute of Technology. This differential is proposed to reflect differences in the salary bases of the two groups.

6. **Services and supplies.** Although needs for services and supplies tend to vary by discipline, the variances are not highly significant in total. Consequently, it is proposed to provide an allowance for services and supplies equal to 10 percent of the amount provided for instructional salaries. If salary changes occur at a rate different from that applying to services and supplies prices, a change in the percentage allowance is warranted.

7. **Equipment.** This is determined in accord with procedures involving replacement schedules and individual determination for items having a replacement cost in excess of $1,000. The sum of the equipment requests is expected to equal 7 percent of the instruction equipment inventory.

8. **Summer sessions.** This item should be separately determined.

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[1] 1973-74 data by discipline and level of course or student will be extrapolated according to 1975 data by discipline. The data presently used are from the University of Colorado, Indiana University, University of Michigan, Michigan State University, University of Missouri, Ohio State University, and the University of Washington.

9. **Threshold support.** If necessary, a minimum level of support for the instruction function should be identified.

B. Nonsponsored Research Formula

The model will provide 1 percent of the instruction budget as a resource for the support of nonsponsored research at the colleges and Oregon Institute of Technology. For the universities, a total percentage equal to that of the "General Fund" support of research at a representative sample of universities will be used (4 percent).

C. Academic Support Formula (Libraries, Audio-Visual, Etc.)

The proposed formula is based in large measure on the Washington *Budget Analysis System for Libraries.*[2] The Washington formula is intended to provide a method for determining a "threshold adequacy" for academic library collections. The model for the academic support function has the following elements:

- A library resources formula which takes into account both enrollment and program factors.
- A library staffing formula.
- A minimum rate for acquisition and a maximum rate for deletion of book holdings.
- A method for computing binding and other operational costs.
- A formula to determine funding the audio-visual services needs.
- A method for determining museum support.

1. **The library resource formula.**

a. 85,000 volumes as a basic or as an opening day collection.

b. 100 volumes per FTE faculty.

c. 15 volumes per FTE student.

d. 350 volumes per bachelor or associate program. (Only one allowance is permitted if both degrees are offered in the same program.)

e. 6,000 volumes per master's program when no doctorate is offered.

f. 3,000 volumes per master's program when a doctorate is offered.

g. 25,000 volumes per doctorate program.

h. A minimum acquisition rate of 5 percent of formula holdings or 5 percent of actual holdings, whichever is greater.

i. A weeding or deletion factor of 2 percent per year of *actual* holdings.

j. The cost allowance per volume will be determined by the chairman of the interinstitutional library council based on averages of combined serials and book expenditures in fiscal year 1974 adjusted for inflation. (For 1974-75 the numbers would have been $18.45 for the universities and $17.37 for the colleges.)

Definitions of terms used in library resource formula.

Volume. A volume is a physical unit of any printed, typewritten, handwritten, mimeographed, or processed work contained in one binding or portfolio, hardbound or paperbound, which has been classified, catalogued and/or otherwise prepared for use. Includes bound periodical volumes and government documents that have been classified and catalogued, counting as a volume such material as is contained in binding or portfolio. One reel of microfilm or five micro-cards or microfiche are reported as a volume.

Items not included as a volume.

- Government documents not meeting definition of a volume.
- College and university catalogues.
- Fragmentary or loose map collections.
- Pamphlets, clippings, unbound newspapers, loose music scores, paintings, prints, phonograph records, and tape recordings.
- Educational curricular materials, such as school texts, curriculum guides, kits and laboratory materials, film strips, records, units of study, circulating periodical collections for student teachers, book jackets, pictures, and others which are not catalogued or accessed or otherwise meet the definition of a volume.
- Telephone books, trade catalogues and other ephemeral materials.

Items included as a volume.

- Prints or plates in portfolio.
- Copies of theses which are retained.
- Material meeting the definition of a volume which is housed in an archive, and educational reference material or audio-visual reference books which meet the definition of a volume but which happen to be housed in a curricular laboratory or an audio-visual section.
- Juvenile books if they are catalogued or accessed.
- Bound volumes of newspapers.

FTE faculty. Includes all academic personnel, exclusive of those employed in sponsored research or statewide public services.

FTE student. The sum of credit hours estimated to be produced in fall, winter, and spring terms, divided by forty-five.

Associate program. Those recognized in a listing of programs prepared by the office of academic affairs. For all degree programs, the office of academic affairs will group programs, where appropriate, to avoid proliferation or duplication of volumes in degree programs.

Bachelor program. Those recognized in a listing of programs prepared by the office of academic affairs.

[2] A system developed by an interinstitutional committee in the state of Washington.

Master's program. Those recognized in a listing of programs prepared by the office of academic affairs.

Doctorate program. Those recognized by the office of academic affairs as requiring an individual library collection in the formula, after consultation with the institution and the chairman of the interinstitutional library council.

2. **The staffing formula.**

a. $Sg = K + \frac{S}{600} + .5M + 2D$

Sg = Total staff generated includes administration, technical services and public services personnel made up of faculty, classified, and FTE student employees.

K = The constant or minimum is ten staff members (representing a minimum viable staff for a library).

S = Four-term cumulative student headcount.[8]

M = Number of master's degree programs.

D = Number of doctoral programs.

b. The following staffing ratio is used:
F (academic/faculty) + C (classified) + S (student) = (Sg total staff)

F = .25 Sg.

C = .50 Sg.

S = .25 Sg.

Sg = Staff generated by formula.

The salary allocation for academic/faculty staff will be funded at an average salary based on the data exchanged with the selected public universities.

The salary allocation for classified staff will be funded at the second step of administrative assistant classification.

The salary allocation for student staff will be funded at the second step of the clerical assistant classification.

3. **Binding formula.** The binding budget is directly related to the acquisition budget. The budget for binding is determined by multiplying the acquisition budget by 8.5 percent.

4. **Services and supplies formula.** The budget for general services and supplies, including travel, will be 5 percent of the acquisition, staffing, and binding budget.

5. **Cooperative programs formula.** For development, implementation, and maintenance of cooperative purchases, networks and systemwide computer development, an allocation amounting to 1 percent of the systemwide budget for libraries will be made available to the chairman of the interinstitutional library council for allocation on advice of the council.

[8] The sum of the number of students enrolled in each of four consecutive academic quarters (fall, winter, spring, and summer).

6. **Other instructional support formula (such as audio-visual, etc.)** The budget allowance will be 2 percent of the instructional budget as calculated by the instruction formula.

7. **Equipment.** This will be determined in accord with procedures involving replacement schedules and individual determination for items having a replacement cost in excess of $1,000.

8. **Museum support.** Support for museums will be determined individually on a line-item basis.

D. The Student Services Model

This function includes:

- Student administrative services
  - Admissions and records
  - Student information systems
- Student financial aids administration
- Placement (not including career planning)
- Student personnel programs (such as advising)
- Foreign student programs
- Programs for special populations
- Student union support.

A special committee of student services officers developed data to identify 1974-75 expenditures and workloads associated with the foregoing services. Analysis of the data revealed such wide variations in the nature and scope of the activities and costs at the several institutions that there appeared to be no set of historical standards that could be equitably applied. However, if the programs for student union support are budgeted on a line-item basis, the expenditures for the remaining student services fall into a three-part pattern when measured against other expenditures.

The student services budget model includes:

1. Programs for special populations at 12 percent of (3), below.

2. Educational activities support on a stepped-formula basis ($5 each for first 5,000 four-term cumulative headcount students; $3 for next 1,000; and $1 thereafter).

3. Support for other student services at 5.5 percent of the instruction budget plus auxiliary activities operations (less debt service) multiplied by the ratio of four-term cumulative headcount to four-term FTE students.

The data exchange with selected public universities for 1975-76 may provide a comparative (external) standard for the function as a whole. At the same time a standardized set of budget accounts will permit comparisons among Oregon colleges and universities.

E. The Operation and Maintenance of the Physical Plant Model

The model for the operation and maintenance of the physical plant is based principally upon the Washington model. The model as proposed is designed to generate

gross financial requirements including expenditures recovered through indirect cost credits. However, service credits are to be considered as add-ons to the model-generated requirements. The following components are included in the model for operation and maintenance of the physical plant.

- A formula allowance for building maintenance.
- A formula allowance for plant rehabilitation and remodeling.
- A formula allowance for janitorial services.
- A formula allowance for grounds maintenance.
- Separately negotiated institutional requirements for campus security.
- Separately negotiated institutional requirements for utilities.
- A formula allowance for maintenance of utility distribution systems.
- A formula allowance for campus delivery service.
- A formula allowance for the administration of physical plant.

1. **Building maintenance formula.** The Washington model requires the following information for building maintenance:

- Current replacement cost of each building.
- Buildings classified into one of three types of construction — wood-frame, masonry-wood, masonry.
- The percentage of each building that is air-conditioned.
- The percentage of each building that is funded by the education and general accounts.

Current replacement cost will be based upon the controller's office building valuation reports. Office of facilities planning staff will assist in determining the classification by construction type and percentage of the building that is air-conditioned. Facilities planning staff will also determine the percentage of each building that is funded by the education and general services accounts. The model generates budget allowances for regular building maintenance plus a special allowance for air conditioning.

a. Replacement cost of wood-frame buildings × .0175.

b. Replacement cost of masonry-wood buildings × .0130.

c. Replacement cost of masonry buildings × .0110.

d. Allowance for air-conditioning is replacement cost of building × percent air-conditioned × .0015.

2. **Plant rehabilitation and remodeling formula.** To fund major rehabilitation and remodeling needs not met through the building maintenance formula, an additional amount should be provided for rehabilitation and remodeling projects costing in excess of $2,500. Since major remodeling appears in the capital construction budget, a relatively small amount is proposed here: 10 percent of the building maintenance formula.

3. **Janitorial services formulas.** The Washington model requires square footage for each building which would be determined by office of facilities planning staff.

a. Staffing. The model allows 1.00 FTE for janitors for each 20,000 square feet of buildings and 1.00 FTE for window-washers for each 350,000 square feet. In addition, there is a proposed allowance of .15 of the staff requirements for supervisory and leave requirements. The formula-generated FTE is multiplied by the annual rate of a Custodial Worker 2 at the second step of the pay range.

$$\frac{\textit{Sq. Ft. of Buildings} \times 1.15}{20{,}000 \text{ Sq. Ft.}} + \frac{\textit{Sq. Ft. of Buildings} \times 1.15}{350{,}000 \text{ Sq. Ft.}} =$$

Full-time equivalent staff required (FTE)
FTE × Custodial Worker 2 annual salary (second step)

b. Supplies. An allowance for janitorial supplies is calculated by multiplying $525 (1974-75 base adjusted for future years by an inflation factor) by the FTE staff required.

c. Equipment. This is determined in accord with other procedures, involving replacement schedules and individual determination for items having a replacement cost in excess of $1,000.

4. **Grounds maintenance formulas.** The Washington model calls for the campus and grounds area to be classified into four categories and provides FTE allowances as follows:

Category	*FTE Allowance*
Very High Intensity	1.00 FTE for each 4 acres
High Intensity	1.00 FTE for each 8 acres
Medium Intensity	1.00 FTE for each 16 acres
Low Intensity	1.00 FTE for each 32 acres.

Office of facilities planning staff will assist in making the determination as to the number of acres in each category.

a. Staffing. The FTE allowances generated by the above formula will be multiplied by .15 for supervisory and leave requirements. The formula-generated FTE will be multiplied by the annual rate for a Groundskeeper 2 at the second step in the range.

NOTE: *Statistical tables depicting the seven elements in the instruction specification described in this paper are available from NACUBO on request. Write to: Editor,* Professional File, *NACUBO, One Dupont Circle, Suite 510, Washington, D.C. 20036.*

$$(1)\ \frac{\text{Acres of Very High Intensity}}{4} \times 1.15$$

$$+$$

$$(2)\ \frac{\text{Acres of High Intensity}}{8} \times 1.15$$

$$+$$

$$(3)\ \frac{\text{Acres of Medium Intensity}}{16} \times 1.15$$

$$+$$

$$(4)\ \frac{\text{Acres of Low Intensity}}{32} \times 1.15$$

$$=$$

Full-time staff required (FTE)

FTE × Groundskeeper 2 annual salary at second step = annual budget allowance.

b. Supplies. The model allows $2,000 per FTE groundskeeper as a basis for supplies for grounds maintenance and proposes to have equipment generated by a separate calculation.

c. Equipment. This is determined in accord with other procedures, involving replacement schedules and individual determination for items having a replacement cost in excess of $1,000.

5. **Campus security.** Allowances for campus security will be separately calculated for each institution.

6. **Utilities.** Because of the uniqueness of institutional utility facilities and the uncertainty of energy prices and supply, separately calculated institutional allowances are proposed for utilities and the operation of utility-generating facilities. It is proposed that the Washington allowance for the maintenance of the utility distribution system (10 percent of the building maintenance allowance) be applied.

7. **Campus delivery service formula.** Campus delivery service allowances will be generated by a formula using $20 (adjusted for inflation in future periods) per staff headcount (academic, classified, student).

Staff headcount × $20 = delivery service allowance.

8. **Physical plant administration formula.** An allowance of 15 percent of formula-generated allowances (not including utilities or campus security) is proposed for physical plant administration, including planning and stores activities.

F. The General Institution Support Model

"General Institution Support" includes the executive management, fiscal operations, personnel, logistical support, and similar administrative services. It would be preferable to have an external or absolute standard for the function (or for its several component activities). It is expected that the data exchange for 1975-76 will begin to provide some external data but there may be difficulty in identifying the workload components. Concurrently, a standardized set of budget accounts is to be developed that would facilitate comparisons among Oregon state colleges and universities. The model for general institution support includes the following components:

- A line-item allocation to meet assessments by other state agencies.
- A two-part variable cost allocation based on dollars expended and the average headcount of students and staff.
- A basic level of funding for the colleges and Oregon Institute of Technology.

1. **Assessments.** Special assessments will be budgeted at an estimated cost in accord with executive department instructions.

a. State restoration fund (self-insurance).

b. State purchasing.

c. Personnel Division.

2. **A two-part variable costs formula.** At least two factors affect general institution support expense — the number of dollars expended and the number of persons served or directed. The relative proportion of impact is unclear. "Dollars expended" for this formula includes all education and general services, auxiliary activity, and operating account expenditures. It should also include statewide services until a revised budget system for the statewide services includes an appropriate charge for the "general institution support" provided to them.

a. Sixty percent of the sum generated by the formula should be based on the number of dollars expended (as defined above).

b. Forty percent of the sum generated should be based on the average four-term headcount of students and staff.

3. **Base funding for colleges and Oregon Institute of Technology.** This was initially established at $200,000 per year. It is anticipated that the data exchange will ultimately provide an external comparison for the function as a whole.

IV. Implementation of the Model

It is no small task to implement the collection of the basic data and to subject the data to the computations anticipated in the Resource Allocation/Acquisition Model described above. That task, however, is neither the beginning nor the end of the effort that is required. The beginning is really the *continuing* development and validation of specifications for the model; the end is in the determination of how to apply the model to a particular set of fiscal, academic and political circumstances.

A. Development and Validation of Model Specifications

The work of CORA/A in achieving a substantial level of current consensus about the specifications of a budget

model is important but far from conclusive. The model consists of many separate elements and standards. The choices that have been made are believed to be reasonable and logical, given present levels of information availability and of understanding of the relationships among objectives, workload, outcomes, and resource needs. It is certain that availability of more relevant data and clearer understanding of input/output relationships will warrant change in the model specifications.

B. Applying the Resource Allocation/Acquisition Model (RA/AM)

The change of budgeting from the present procedures to reliance on a functional model of the type represented by the RA/AM will raise numerous questions of fundamental significance to the institutions of the state system.

1. **Maintenance of flexibility of administration.** The model proposes that the total budget of an institution be requested on the basis of individual calculations relating to each function and academic program. However, the model generates recommended sums based on a standard or average. At one institution at a particular time in its existence it may be desired to emphasize library development, or to improve student services, or to improve the quality of a particular academic program. The use of a budget model in no way should be permitted to bar the exercise of administrative judgment (within the limits of law and board policy) in the internal management of the institution. Each institution is a dynamic entity. Its vitality and its distinctive character would be destroyed — reduced to lifeless mediocrity — were the institution to be required to expend funds in precise relation to the elements in a static mathematical model.

2. **The model as a goal.** It has long been observed that expenditures in support of department of higher education institutions are significantly below the average per-student expenditures of similar institutions elsewhere. The RA/AM indicates that such differences are substantial. The determination of the state of Oregon to expand the opportunities for postsecondary education in the 1960s is to be applauded. Given the fiscal resources of the state, the support given to institutions of the department of higher education has been substantial.

Now the state looks forward to an extended period of relatively stable enrollment — a period of managed equilibrium. Such a period clearly offers the state the opportunity to establish the model as a goal. It is unlikely that the resources of the state will permit achieving the goal in a single step but steady progress toward that end is a reasonable objective.

3. **Maintenance of current levels of support.** In proposing a more sensitive allocation/acquisition model, CORA/A has been concerned lest implementation of the model result in the increase of the funds made available to one institution at the expense of another. It is not anticipated that in the foreseeable future there could be a set of circumstances in which such a result could occur. In implementing the RA/AM it is intended that there be no reduction in the financial resources available to any of the institutions.

Avoidance of reductions in expenditure does not imply, however, that present proportional relationships among the institutions will remain unchanged. The formula may indicate that one or more institutions happen to be more seriously underfunded than others. It is a matter of unanimity in the CORA/A that relieving the distress of one institution ought not be achieved at the direct expense of the others.

4. **If the model is partially funded** — Fiscal resources of the state may require that appropriations fund only a portion of the amount warranted by the RA/AM. Should this occur, it is intended that allocations by the board to the institutions would be based on a principle of proportionality. Example: Assume that Institution A is currently funded at 80 percent of the amount warranted by the model and Institution B at 90 percent. To the extent permitted by additional funding, both institutions would be advanced but Institution A would increase (measured by percentage) at twice the rate of Institution B. The process, when applied to six or seven institutions, will be mathematically more complicated than this simplified description suggests. However, equity in the allocation of funds acquired as a result of the use of a model depends upon establishment of this principle.

V. The Unfinished Business of CORA/A

This report has described a Resource Allocation/Acquisition Model in positive terms. The model incorporates a large number of specific recommendations on which CORA/A's agreement is quite tentative. The various formulas include a mix of comparative, historical, and quasi-objective standards. The model is strongly believed to be a significant improvement on the former set of budget procedures (providing a more sophisticated reflection of institutional differences). It is equally clear to the committee that the present model should be viewed as a viable tool but also as one which is subject to significant improvement. It is the intent that CORA/A will continue in existence as a focal point for staff review of the adequacy and propriety of the RA/AM and as the primary agent for identifying the elements of the model most in need of additional analysis and development.

A. Further Analysis and Development of Specifications and Standards

The following recitation of issues might be called a preliminary agenda. It is indicative rather than exhaustive.

1. **Replacement of the "historical" standards.** The formulas for the student services and general institution support functions are based on presumed historical (actual) standards. But "what is" is not necessarily "what ought to be." CORA/A needs to continue to press in both these functions for the development of either a comparative (external) or an objective standard.

2. **Replacement of "line-item" elements in the model.** For a variety of reasons (and in the absence of identifiable standards), the model assumes that some expenditures will simply be proposed after analysis of the individual budget items (such as salaries and supplies). Campus security, utilities, and museums fall in this category. Although development of formulas to apply to such elements of the model is difficult, CORA/A ought to continue to seek a less arbitrary approach to the budgeting for these activities.

3. **Replacement of "dependent variables."** Throughout the model, there are formula elements and standards that depend on quantities that are previously determined by formula. Technical support of the instruction function, for example, is deemed to have a direct relationship to the number of instructional faculty. This assumption has some basis in fact but it may be preferable to find a more direct measure of the work to be performed by the technical support staff. It is necessary at this point only to emphasize that there are many dependent variables in the model and CORA/A must seek to redefine the elements and standards in the formulas for such activities.

4. **Validation of the "conventions" used in applying the model.** In applying the model to the data, the board's staff necessarily adopted a methodology in utilizing the data. For example, the office of academic affairs has determined a unit value of doctoral programs for purposes of determining library book allowances. CORA/A should review the choices made. There are numerous other similar decisions that the staff has made. These are documented but they also need thorough review and validation at least by CORA/A, if not by the board.

5. **Validation of data sources.** CORA/A has been deeply involved in identifying the data to be used in applying the RA/AM. It has agreed, for example, to the use of the data provided as a result of the data exchanged among selected public universities in determining the level of support for the instruction function. At some future time, it may be more appropriate for the model to rely on data produced by the IEP from NCHEMS. Such decisions should be recommended by or concurred in by CORA/A.

6. **Development of additional formulas.**

a. The functions carried out at the University of Oregon (UO) Health Sciences Center are quite different from those of the other institutions. Although there are apparent similarities, CORA/A has not concluded that the RA/AM, in its present form, could be applied at the UO Health Sciences Center.

b. The application of RA/AM to the Oregon Institute of Technology poses a number of serious questions that may require substantial modification of the model.

c. When the education and general accounts budgets are provided for in the model, it will be appropriate for CORA/A to address the budgets for the statewide public services and, perhaps, for the auxiliary activities.

B. Appraisal of the Education Effect of the Model

The Resource Allocation/Acquisition Model has been developed in response to very real concerns about the propriety of present procedures. The essential expressed concerns are that the present procedures provide neither adequate support of academic programs nor an equitable apportionment of the available funds. In a more fundamental sense, the concern is about the adequacy of the educational experience provided for students at institutions of the department of higher education. The RA/AM will not, of itself, change that educational experience. The model may, however, have profound indirect effects.

CORA/A will have a continued responsibility to review those effects. CORA/A will necessarily review the budgets proposed as a result of applying the model to assess its impact on institutions and the functions and activities within institutions. This responsibility will require keen sensitivity to academic reality and the relationships of budgets to the educational objectives of the institutions.

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